#10

SEQUENCE LISTING

<110> WALKER, SUZANNE

<120> CRYSTALS OF THE ESCHERICHIA COLI MEMBRANE-ASSOCIATED GLYCOSYLTRANSFERASE (MURG) PROTEIN, ATOMIC COORDINATES AND THREE DIMENSIONAL STRUCTURES THEREOF, ATOMIC COORDINATES AND THREE DIMENSIONAL STRUCTURES OF BINDING DOMAINS THEREOF, IMAGES THEREOF, AND METHODS OF CRYSTALLIZING MURG PROTEINS, MODELS OF UDP-GLYCOSYLTRANSFERASES, MURG PROTEINS AND BINDING SITES, METHODS OF MAKING MODELS, METHODS OF USING MODELS OF MURG, COMPOUNDS THAT BIND, INHIBIT OR STIMULATE MURG PROTEINS, AND THERAPEUTIC COMPOSITIONS THEREOF

<130> 4555-105

<140> 09/829,275
<141> 2001-04-09

<160> 8

<170> PatentIn Ver. 2.1

<210> 1
<211> 364
<212> PRT
<213> Escherichia coli

<400> 1

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Met Met Ser Gly Gln Gly Lys Arg Leu Met Val Met Ala Gly Gly Thr
  1               5                  10                  15

Gly Gly His Val Phe Pro Gly Leu Ala Val Ala His His Leu Met Ala
             20                  25                  30

Gln Gly Trp Gln Val Arg Trp Leu Gly Thr Ala Asp Arg Met Glu Ala
         35                  40                  45

Asp Leu Val Pro Lys His Gly Ile Glu Ile Asp Phe Ile Arg Ile Ser
     50                  55                  60

Gly Leu Arg Gly Lys Gly Ile Lys Ala Leu Ile Ala Ala Pro Leu Arg
 65                  70                  75                  80

Ile Phe Asn Ala Trp Arg Gln Ala Arg Ala Ile Met Lys Ala Tyr Lys
                 85                  90                  95

Pro Asp Val Val Leu Gly Met Gly Gly Tyr Val Ser Gly Pro Gly Gly
            100                 105                 110

Leu Ala Ala Trp Ser Leu Gly Ile Pro Val Val Leu His Glu Gln Asn
        115                 120                 125

Gly Ile Ala Gly Leu Thr Asn Lys Trp Leu Ala Arg Ile Ala Thr Lys
    130                 135                 140
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Val Met Gln Ala Glu Pro Gly Ala Phe Pro Asn Ala Glu Val Val Gly
145 150 155 160

Asn Pro Val Arg Thr Asp Val Leu Ala Leu Pro Leu Pro Gln Gln Arg
165 170 175

Leu Ala Gly Arg Glu Gly Pro Val Arg Val Leu Val Val Gly Gly Ser
180 185 190

Gln Gly Ala Arg Ile Leu Asn Gln Thr Met Pro Gln Val Ala Ala Lys
195 200 205

Leu Gly Asp Ser Val Ile Ile Trp His Gln Ser Gly Lys Gly Ser Gln
210 215 220

Gln Ser Val Glu Gln Ala Tyr Ala Glu Ala Gly Gln Pro Gln His Lys
225 230 235 240

Val Thr Glu Phe Ile Asp Asp Met Ala Ala Ala Tyr Ala Trp Ala Asp
245 250 255

Val Val Val Cys Arg Ser Gly Ala Leu Thr Val Ser Glu Ile Ala Ala
260 265 270

Ala Gly Leu Pro Ala Leu Phe Val Pro Phe Gln His Lys Asp Arg Gln
275 280 285

Gln Tyr Trp Asn Ala Leu Pro Leu Glu Lys Ala Gly Ala Ala Lys Ile
290 295 300

Ile Glu Gln Pro Gln Leu Ser Val Asp Ala Val Ala Asn Thr Leu Ala
305 310 315 320

Gly Trp Ser Arg Glu Thr Leu Leu Thr Met Ala Glu Arg Ala Arg Ala
325 330 335

Ala Ser Ile Pro Asp Ala Thr Glu Arg Val Ala Asn Glu Val Ser Arg
340 345 350

Val Ala Arg Ala Leu Glu His His His His His His
355 360

<210> 2
<211> 351
<212> PRT
<213> Haemophilus influenzae

<400> 2
Met Lys Asn Lys Lys Leu Leu Val Met Ala Gly Gly Thr Gly Gly His
1 5 10 15

Val Phe Pro Ala Ile Ala Val Ala Gln Thr Leu Gln Lys Gln Glu Trp
20 25 30

Asp Ile Cys Trp Leu Gly Thr Lys Asp Arg Met Glu Ala Gln Leu Val
35 40 45

```
Pro Lys Tyr Gly Ile Pro Ile Arg Phe Ile Gln Ile Ser Gly Leu Arg
     50                  55                  60

Gly Lys Gly Ile Lys Ala Leu Leu Asn Ala Pro Phe Ala Ile Phe Arg
 65                  70                  75                  80

Ala Val Leu Gln Ala Lys Lys Ile Ile Gln Glu Glu Lys Pro Asp Ala
                 85                  90                  95

Val Leu Gly Met Gly Gly Tyr Val Ser Gly Pro Ala Gly Val Ala Ala
            100                 105                 110

Lys Leu Cys Gly Val Pro Ile Ile Leu His Glu Gln Asn Ala Ile Ala
        115                 120                 125

Gly Leu Thr Asn Lys Leu Leu Gly Lys Ile Ala Thr Cys Val Leu Gln
    130                 135                 140

Ala Phe Pro Thr Ala Phe Pro Met Ala Glu Val Val Gly Asn Pro Val
145                 150                 155                 160

Arg Glu Asp Leu Phe Glu Met Pro Asn Pro Asp Ile Arg Phe Ser Asp
                165                 170                 175

Arg Glu Glu Lys Leu Arg Val Leu Val Val Gly Gly Ser Gln Gly Ala
            180                 185                 190

Arg Val Leu Asn His Thr Leu Pro Lys Val Val Ala Gln Leu Ala Asp
        195                 200                 205

Lys Leu Glu Phe Arg His Gln Val Gly Lys Gly Ala Val Glu Glu Val
    210                 215                 220

Ser Gln Leu Tyr Gly Glu Asn Leu Glu Gln Val Lys Ile Thr Glu Phe
225                 230                 235                 240

Ile Asp Asn Met Ala Glu Ala Tyr Ala Trp Ala Asp Val Val Ile Cys
                245                 250                 255

Arg Ser Gly Ala Leu Thr Val Cys Glu Ile Ala Ala Val Gly Ala Ala
            260                 265                 270

Ala Ile Phe Val Pro Phe Gln His Lys Asp Arg Gln Gln Tyr Leu Asn
        275                 280                 285

Ala Lys Tyr Leu Ser Asp Val Gly Ala Ala Lys Ile Ile Glu Gln Ala
    290                 295                 300

Asp Leu Thr Pro Glu Ile Leu Val Asn Tyr Leu Lys Asn Leu Thr Arg
305                 310                 315                 320

Glu Asn Leu Leu Gln Met Ala Leu Lys Ala Lys Thr Met Ser Met Pro
                325                 330                 335

Asn Ala Ala Gln Arg Val Ala Glu Val Ile Lys Gln Tyr Ser Asn
            340                 345                 350
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<210> 3
<211> 362
<212> PRT
<213> Enterococcus faecalis

<400> 3

Met Lys Ile Leu Val Thr Gly Gly Gly Thr Gly Gly His Ile Tyr Pro
1 5 10 15

Ala Leu Ser Phe Val Glu His Val Lys Lys Glu Ala Pro Ala Thr Glu
20 25 30

Phe Leu Tyr Val Gly Thr Glu Asn Gly Leu Glu Ser Gln Ile Val Pro
35 40 45

Lys Ala Lys Ile Pro Phe Lys Thr Ile Lys Ile Gln Gly Phe Lys Arg
50 55 60

Ser Leu Ser Pro Gln Asn Phe Lys Thr Ile Tyr Leu Phe Leu Thr Ser
65 70 75 80

Ile Asn Lys Ala Lys Lys Ile Ile Arg Glu Phe Gln Pro Asp Val Val
85 90 95

Ile Gly Thr Gly Gly Tyr Val Ser Gly Ala Val Val Tyr Ala Ala His
100 105 110

Gln Leu Lys Ile Pro Thr Ile Ile His Glu Gln Asn Ser Ile Pro Gly
115 120 125

Met Thr Asn Lys Phe Leu Ser Arg Tyr Val Asp Lys Ile Ala Ile Cys
130 135 140

Phe Pro Asp Val Ala Ser Phe Phe Pro Lys Glu Lys Thr Ile Leu Thr
145 150 155 160

Gly Asn Pro Arg Gly Gln Glu Val Val Thr Val Glu Lys Ser Ala Ile
165 170 175

Leu Ser Glu Phe Gly Leu Asp Pro Ala Lys Lys Thr Val Val Leu Phe
180 185 190

Gly Gly Ser Arg Gly Ala Leu Lys Ile Asn Gln Ala Phe Glu Gln Ala
195 200 205

Phe Pro Leu Phe Glu Glu Arg Glu Tyr Gln Val Leu Tyr Ala Ser Gly
210 215 220

Glu Arg Tyr Tyr Gln Glu Leu Gln Glu Ser Leu Lys Leu Ser Glu Lys
225 230 235 240

Lys Leu Thr Asn Ile Ser Val Gln Pro Tyr Ile Asp Lys Met Val Glu
245 250 255

Val Met Ala Asn Thr Asp Leu Met Val Gly Arg Ala Gly Ala Thr Ser
260 265 270

```
Ile Ala Glu Phe Thr Ala Leu Gly Leu Pro Ala Ile Leu Ile Pro Ser
        275                 280                 285

Pro Tyr Val Thr Asn Asp His Gln Thr Lys Asn Ala Gln Ser Leu Val
    290                 295                 300

Lys Val Gly Ala Val Glu Met Ile Pro Asp Ala Glu Leu Thr Gly Ala
305                 310                 315                 320

Arg Leu Val Ala Ala Ile Asp Asp Ile Leu Leu Asn Asn Glu Lys Arg
                325                 330                 335

Gln Gln Met Ala Thr Ala Ser Lys Gly Glu Arg Ile Pro Asp Ala Ser
            340                 345                 350

Asp Arg Leu Tyr Gln Trp Lys Thr Leu Val
        355                 360
```

<210> 4
<211> 360
<212> PRT
<213> Enterococcus hirae

<400> 4

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Met Lys Ile Leu Val Thr Gly Gly Gly Thr Gly Gly His Ile Tyr Pro
  1               5                  10                  15

Ala Leu Ala Phe Val Asn Tyr Val Lys Thr Lys Glu Pro Asn Thr Glu
            20                  25                  30

Phe Met Tyr Val Gly Ala Gln Arg Gly Leu Glu Asn Lys Ile Val Pro
        35                  40                  45

Glu Thr Gly Met Pro Phe Arg Thr Leu Glu Ile Gln Gly Phe Gln Arg
    50                  55                  60

Lys Leu Ser Leu His Asn Leu Lys Thr Ile Gln Leu Phe Leu Lys Ser
65                  70                  75                  80

Ile Arg Glu Ala Lys Lys Ile Leu Lys Glu Phe Lys Pro Asp Val Val
                85                  90                  95

Ile Gly Thr Gly Gly Tyr Val Ser Gly Ala Val Val Tyr Ala Ala Ser
            100                 105                 110

Lys Leu Ala Ile Pro Thr Ile Ile His Glu Gln Asn Ser Val Pro Gly
        115                 120                 125

Ile Thr Asn Lys Phe Leu Ser Arg Tyr Val Asp Arg Ile Ala Leu Ser
    130                 135                 140

Phe Glu Asp Ala Ala Pro Phe Phe Pro Ala Glu Lys Ser Ser Leu Ile
145                 150                 155                 160

Gly Asn Pro Arg Ala Gln Glu Val Ala Asp Met Asp Lys Ser Lys Ile
                165                 170                 175
```

Leu Ala Thr Tyr Gly Leu Asp Pro Glu Lys Lys Thr Val Leu Ile Phe
180 185 190

Gly Gly Ser Gln Gly Ala Leu Lys Ile Asn Gln Ala Val Thr Glu Phe
195 200 205

Leu Met Ser Phe Asp Gln Glu Tyr Gln Val Leu Tyr Ala Ser Gly Glu
210 215 220

Arg Tyr Tyr Lys Asp Ile Gln Thr Lys Val Pro Ala Cys Ala Asn Val
225 230 235 240

Ser Ile Gln Pro Tyr Ile Asn Lys Met Ala Glu Val Met Ala Ser Ser
245 250 255

Asp Leu Leu Val Gly Arg Ala Gly Ala Thr Ser Ile Ala Glu Leu Thr
260 265 270

Ala Leu Gly Leu Pro Ala Ile Leu Ile Pro Ser Pro Tyr Val Thr Asn
275 280 285

Asp His Gln Thr Lys Asn Ala Met Ser Leu Val Lys Asn Asn Ala Ala
290 295 300

Lys Met Ile Lys Asp Asp Glu Leu Asp Gly Arg Ser Leu Lys Gln Ala
305 310 315 320

Ile Glu Glu Ile Met Thr Asn Asp Gln Leu Gln Lys Gln Met Ser Leu
325 330 335

Ala Ser Lys Gln Gln Gly Ile Pro Asp Ala Ser Glu Arg Met Tyr Glu
340 345 350

Leu Val Lys Ser Leu Ile Gln Lys
355 360

<210> 5
<211> 352
<212> PRT
<213> Streptococcus pneumoniae

<400> 5
Met Lys Lys Ile Val Phe Thr Gly Gly Gly Thr Val Gly His Val Thr
1 5 10 15

Leu Asn Leu Leu Leu Met Pro Lys Phe Ile Glu Asp Gly Trp Glu Val
20 25 30

His Tyr Ile Gly Asp Lys Arg Gly Ile Glu His Gln Glu Ile Leu Lys
35 40 45

Ser Gly Leu Asp Val Thr Phe His Ser Ile Ala Thr Gly Lys Leu Arg
50 55 60

Arg Tyr Phe Ser Trp Gln Asn Met Leu Asp Val Phe Lys Val Cys Trp
65 70 75 80

Gly Ile Val Gln Ser Leu Phe Ile Met Leu Arg Leu Arg Pro Gln Thr
85 90 95

Leu Phe Ser Lys Gly Gly Phe Val Ser Val Pro Pro Val Ile Ala Ala
100 105 110

Arg Val Ser Gly Val Pro Val Phe Ile His Glu Ser Asp Leu Ser Met
115 120 125

Gly Leu Ala Asn Lys Ile Ala Tyr Lys Phe Ala Thr Lys Met Tyr Ser
130 135 140

Thr Phe Glu Gln Ala Ser Ser Leu Ser Lys Val Glu His Val Gly Ala
145 150 155 160

Val Thr Lys Val Ser Asp Gln Lys Asn Pro Glu Pro Asp Glu Leu Val
165 170 175

Asp Ile Gln Ser His Phe Asn His Lys Leu Pro Thr Val Leu Phe Val
180 185 190

Gly Gly Ser Ala Gly Ala Arg Val Phe Asn Gln Leu Val Thr Asp His
195 200 205

Lys Lys Glu Leu Thr Glu Arg Tyr Asn Ile Ile Asn Leu Thr Gly Asp
210 215 220

Ser Ser Leu Asn Glu Leu Ser Gln Asn Leu Phe Arg Val Asp Tyr Val
225 230 235 240

Thr Asp Leu Tyr Gln Pro Leu Met Glu Leu Ala Asp Ile Val Val Thr
245 250 255

Arg Gly Gly Ala Asn Thr Ile Phe Glu Leu Leu Ala Ile Ala Lys Leu
260 265 270

His Val Ile Val Pro Leu Gly Arg Glu Ala Ser Arg Gly Asp Gln Leu
275 280 285

Glu Asn Ala Ala Tyr Phe Val Lys Lys Gly Tyr Ala Glu Asp Leu Gln
290 295 300

Glu Ser Asp Leu Thr Leu Asp Ser Leu Glu Glu Lys Leu Ser His Leu
305 310 315 320

Leu Ser His Lys Glu Asp Tyr Gln Ala Lys Met Lys Ala Ser Lys Glu
325 330 335

Leu Lys Ser Leu Ala Asp Phe Tyr Gln Leu Leu Lys Lys Asp Leu Ser
340 345 350

<210> 6
<211> 385
<212> PRT
<213> Rickettsia prowazekii

<400> 6

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Met Lys Lys Ile Ile Leu Val Ala Gly Gly Ile Gly Gly His Phe Phe
 1               5                  10                  15

Pro Ala Val Ala Leu Gly Glu Glu Leu Ile Lys Arg Gly Tyr Ile Val
            20                  25                  30

His Phe Ile Thr Asp Leu Arg Cys Lys Lys Tyr Ile Asn Lys Asp Met
        35                  40                  45

Lys Ile Ile Phe His Ile Leu Asn Leu Lys Arg Phe Ser Asn Ile Phe
    50                  55                  60

Leu Phe Leu Pro Ile Leu Ser Ile Thr Phe Leu Lys Ser Ile Arg Leu
65                  70                  75                  80

Ile Tyr Asn Ile Lys Cys Cys Val Ile Ile Gly Phe Gly Gly Tyr Pro
                85                  90                  95

Val Ile Ala Pro Met Phe Ala Ala Ile Phe Leu Arg Ile Pro Ile Ile
            100                 105                 110

Ile His Glu Gln Asn Ser Tyr Leu Gly Lys Val Asn Lys Phe Phe Ala
        115                 120                 125

Arg Phe Ala Lys Lys Ile Ala Thr Ser Tyr Glu Asp Ile Lys Asn Leu
    130                 135                 140

Pro Glu Phe Ala Lys Ser Lys Ile Val Leu Thr Gly Gly Ile Val Arg
145                 150                 155                 160

Lys Asn Ile Arg Glu Leu Asp Ser Phe Met Tyr Ser Val Ser Gln His
                165                 170                 175

Ser Leu Thr Lys Leu Thr Gln Thr Ala Leu Thr Asn Thr Phe Asn Pro
            180                 185                 190

Leu Val Lys Gly Arg Asn Asp Glu Phe Ala Asn Ser Asn Ile Phe Thr
        195                 200                 205

Ile Phe Ile Phe Gly Gly Ser Gln Gly Ala Lys Leu Phe Ser Glu Leu
    210                 215                 220

Ile Pro Ala Ser Ile Lys Ile Leu Met Lys Lys Gln Pro Ser Leu Glu
225                 230                 235                 240

Leu Asn Ile Ile Gln Gln Ala Ala Leu Asp His Gln Val Lys Ile Lys
                245                 250                 255

Asp Ile Tyr Ser Lys Leu Asn Ile Thr Tyr Glu Phe Ala Glu Phe Phe
            260                 265                 270

Asp Asn Ile Ala Leu Gln Tyr Lys Val Ala Asn Leu Val Ile Ser Arg
        275                 280                 285

Ala Gly Ala Ser Thr Ile Glu Glu Leu Thr Tyr Ile Gly Leu Pro Ala
    290                 295                 300
```

Ile Phe Ile Pro Leu Pro Ser Ala Ala Asp Asn His Gln Tyr Tyr Asn
305 310 315 320

Ala Lys Leu Leu Glu Asp Asn Lys Ala Gly Trp Cys Leu Glu Gln Asn
325 330 335

Asn Ile Ser Ser Glu Lys Leu Ala Asp Lys Ile Leu Asp Leu Ile Ser
340 345 350

Asn Arg Gln Leu Leu Glu Asp Ala Ser Gln Asn Leu Leu Asn Arg Lys
355 360 365

Lys Glu Gly His Val Leu Leu Ser Asn Leu Ile Glu Asp Thr Val Phe
370 375 380

Leu
385

<210> 7
<211> 363
<212> PRT
<213> Bacillus subtilis

<400> 7
Met Arg Ile Ala Ile Ser Gly Gly Gly Thr Gly Gly His Thr Tyr Pro
1 5 10 15

Ala Leu Ala Phe Ile Lys Glu Val Gln Arg Arg His Pro Asn Val Glu
20 25 30

Phe Leu Tyr Ile Gly Thr Glu Asn Gly Leu Glu Lys Lys Ile Val Glu
35 40 45

Arg Glu Asn Ile Pro Phe Arg Ser Ile Glu Ile Thr Gly Phe Lys Arg
50 55 60

Lys Leu Ser Phe Glu Asn Val Lys Ile Val Met Arg Phe Leu Lys Gly
65 70 75 80

Val Lys Lys Ser Lys Ser Tyr Leu Ala Glu Phe Lys Pro Asp Ala Val
85 90 95

Ile Gly Thr Gly Gly Tyr Val Cys Gly Pro Val Val Tyr Ala Ala Ala
100 105 110

Lys Met Gly Ile Pro Thr Ile Val His Glu Gln Asn Ser Leu Pro Gly
115 120 125

Ile Thr Asn Lys Phe Leu Ser Lys Tyr Val Asn Lys Val Ala Ile Cys
130 135 140

Phe Glu Glu Ala Lys Ser His Phe Pro Ser Glu Lys Val Val Phe Thr
145 150 155 160

Gly Asn Pro Arg Ala Ser Glu Val Val Ser Ile Lys Thr Gly Arg Ser
165 170 175

```
Leu Ala Glu Phe Lys Leu Ser Glu Asp Lys Lys Thr Val Leu Ile Phe
            180                 185                 190

Gly Gly Ser Arg Gly Ala Ala Pro Ile Asn Arg Ala Val Ile Asp Met
        195                 200                 205

Gln Asp Val Leu Lys Thr Arg Asp Tyr Gln Val Leu Tyr Ile Thr Gly
    210                 215                 220

Glu Val His Tyr Glu Lys Val Met Asn Glu Leu Lys Ser Lys Gly Ala
225                 230                 235                 240

Ala Asp Asn Met Val Thr Lys Pro Phe Leu His Gln Met Pro Glu Tyr
                245                 250                 255

Leu Lys Ala Ile Asp Val Ile Val Ala Arg Ala Gly Ala Ala Thr Ile
            260                 265                 270

Ala Glu Ile Thr Ala Leu Gly Ile Pro Ser Val Leu Ile Pro Ser Pro
        275                 280                 285

Tyr Val Thr Ala Asn His Gln Glu Val Asn Ala Arg Ser Leu Gly Gln
    290                 295                 300

His Asp Ala Ala Ile Val Leu Lys Glu Thr Glu Leu Ser Gly Glu Lys
305                 310                 315                 320

Leu Ile Glu Ala Leu Asp Arg Ile Val Leu Asn Glu Gln Thr Leu Lys
                325                 330                 335

Glu Met Ser Glu Arg Thr Lys Ser Leu Gly Val Pro Asp Ala Ala Ala
            340                 345                 350

Arg Leu Tyr Ser Val Leu Glu Glu Leu Lys Lys
        355                 360
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<210> 8
<211> 410
<212> PRT
<213> Mycobacterium tuberculosis

<400> 8

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Met Lys Asp Thr Val Ser Gln Pro Ala Gly Gly Arg Gly Ala Thr Ala
  1               5                  10                  15

Pro Arg Pro Ala Asp Ala Ala Ser Pro Ser Cys Gly Ser Ser Pro Ser
             20                  25                  30

Ala Asp Ser Val Ser Val Val Leu Ala Gly Gly Gly Thr Ala Gly His
         35                  40                  45

Val Glu Pro Ala Met Ala Val Ala Asp Ala Leu Val Ala Leu Asp Pro
     50                  55                  60

Arg Val Arg Ile Thr Ala Leu Gly Thr Leu Arg Gly Leu Glu Thr Arg
 65                  70                  75                  80
```

Leu Val Pro Gln Arg Gly Tyr His Leu Glu Leu Ile Thr Ala Val Pro
85 90 95

Met Pro Arg Lys Pro Gly Gly Asp Leu Ala Arg Leu Pro Ser Arg Val
100 105 110

Trp Arg Ala Val Arg Glu Ala Arg Asp Val Leu Asp Asp Val Asp Ala
115 120 125

Asp Val Val Val Gly Phe Gly Gly Tyr Val Ala Leu Pro Ala Tyr Leu
130 135 140

Ala Ala Arg Gly Leu Pro Leu Pro Pro Arg Arg Arg Arg Arg Ile Pro
145 150 155 160

Val Val Ile His Glu Ala Asn Ala Arg Ala Gly Leu Ala Asn Arg Val
165 170 175

Gly Ala His Thr Ala Asp Arg Val Leu Ser Ala Val Pro Asp Ser Gly
180 185 190

Leu Arg Arg Ala Glu Val Val Gly Val Pro Val Arg Ala Ser Ile Ala
195 200 205

Ala Leu Asp Arg Ala Val Leu Arg Ala Glu Ala Arg Ala His Phe Gly
210 215 220

Phe Pro Asp Asp Ala Arg Val Leu Leu Val Phe Gly Gly Ser Gln Gly
225 230 235 240

Ala Val Ser Leu Asn Arg Ala Val Ser Gly Ala Ala Ala Asp Leu Ala
245 250 255

Ala Ala Gly Val Cys Val Leu His Ala His Gly Pro Gln Asn Val Leu
260 265 270

Glu Leu Arg Arg Arg Ala Gln Gly Asp Pro Pro Tyr Val Ala Val Pro
275 280 285

Tyr Leu Asp Arg Met Glu Leu Ala Tyr Ala Ala Ala Asp Leu Val Ile
290 295 300

Cys Arg Ala Gly Ala Met Ile Val Ala Glu Val Ser Ala Val Gly Leu
305 310 315 320

Pro Ala Ile Tyr Val Pro Leu Pro Ile Gly Asn Gly Glu Gln Arg Leu
325 330 335

Asn Ala Leu Pro Val Val Asn Ala Gly Gly Gly Met Val Val Ala Asp
340 345 350

Ala Ala Leu Thr Pro Glu Leu Val Ala Arg Gln Val Ala Gly Leu Leu
355 360 365

Thr Asp Pro Ala Arg Leu Ala Ala Met Thr Ala Ala Ala Ala Arg Val
370 375 380

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Gly His Arg Asp Ala Ala Gly Gln Val Ala Arg Ala Ala Leu Ala Val
385                 390                 395                 400

Ala Thr Gly Ala Gly Ala Arg Thr Thr Thr
                405                 410
```